

What is claimed is:

1. A method of masking faulty pixels in an imager, the method comprising:
  - (a) exposing the imager to radiation;
  - (b) identifying a faulty pixel in the imager;
  - (c) determining outputs of a plurality of other pixels located about the faulty pixel; and
  - (d) masking an output of the faulty pixel using the outputs of the plurality of other pixels, whereby a masked output of the faulty pixel can be provided in an image produced by the imager.
2. The method of claim 1, further comprising:
  - (e) producing an image from outputs of a plurality of pixels in the imager, wherein the image includes the masked output of the faulty pixel.
3. The method of claim 1, wherein identifying the faulty pixel comprises accessing memory associated with the imager to determine the location of the faulty pixel in the imager.
4. The method of claim 1, wherein masking the output of the faulty pixel comprises replacing the output of the faulty pixel with an output value based exclusively on an output of multiple pixels surrounding the at least one faulty pixel.
5. The method of claim 4, wherein replacing said output of the faulty pixel comprises providing the faulty pixel with an output value obtained by interpolating output values of at least two pixels surrounding the at least one faulty pixel.
6. The method of claim 1, further comprising converting the outputs of pixels in the imager from an analog format to a digital format prior to producing an image.
7. The method of claim 1, further comprising, before exposing the imager to radiation, testing a selected pixel from the imager to determine whether it is faulty.
8. The method of claim 1, wherein pixels of the imager can discriminate between multiple colors and wherein the faulty pixel is designated to detect radiation of a first color, and wherein the plurality of other pixels chosen to mask the output of the faulty pixel are all designated to detect radiation of the first color.

9. A method of correcting a faulty pixel in an imager, the method comprising:  
(a) exposing the imager to radiation;  
(b) identifying the faulty pixel in said imager;  
(c) measuring an output of the faulty pixel;  
(d) determining whether the faulty pixel is saturated; and  
(e) correcting the faulty pixel with a pixel correction technique specifically adapted for correcting either a saturated pixel or an unsaturated pixel, whereby a corrected output of the faulty pixel can be provided in an image produced by the imager.

10. The method of claim 9, wherein when the faulty pixel is determined to be saturated, the pixel correction technique masks an output of the faulty pixel using the outputs of the plurality of other pixels.

11. The method of claim 10, wherein masking said output of the faulty pixel comprises providing the faulty pixel with an output value obtained by interpolating output values of at least two pixels surrounding the at least one faulty pixel.

12. The method of claim 9, wherein when the faulty pixel is determined to be unsaturated, the pixel correction technique corrects an output of the faulty pixel by performing an operation on said output.

13. The method of claim 12, wherein said operation comprises increasing or decreasing the magnitude of said output.

14. The method of claim 9, wherein identifying the faulty pixel comprises accessing memory associated with the imager to determine the location of the faulty pixel in the imager.

15. The method of claim 9, further comprising converting the outputs of pixels in the imager from an analog format to a digital format prior to producing an image.

16. The method of claim 9, further comprising, before exposing the imager to radiation, testing a selected pixel from the imager to determine whether it is faulty.

17. A method of testing a selected pixel to determine whether it is faulty, the method comprising:

- (i) electronically resetting the selected pixel to a defined charge;
- (ii) reading the selected pixel's output; and

(iii) comparing the selected pixel's output to an expected value based upon the defined charge provided to the selected pixel, whereby if the selected pixel's output significantly deviates from said expected value, designating the selected pixel as faulty.

18. The method of claim 17, further comprising:

if the selected pixel's output significantly deviates from the expected value, determining whether the selected pixel is partially or completely corrupted, wherein if the selected pixel is partially corrupted pixel, it is to be imaged by a first technique during readout and if the selected pixel is completely corrupted, it is to be imaged by a second technique during readout.

19. The method of claim 18, wherein determining whether the selected pixel is partially or completely corrupted comprises determining how far the selected pixel's output deviates from the expected value, such that if the selected pixel's output deviates by more than a defined amount from the expected value deeming the selected pixel to be completely corrupted and if the selected pixel's output deviates by no more than a defined amount from the expected value deeming the selected pixel to be partially corrupted.

20. The method of claim 18, wherein the first correction technique comprises adjusting the output of the selected pixel and wherein the second correction technique comprises replacing the output of the selected pixel with an average of the outputs of pixels located about the selected pixel.

21. The method of claim 17, further comprising:

if the selected pixel is found to be faulty, storing its location in memory.

22. The method of claim 17, further comprising:

exposing the selected pixel to a defined amount of test radiation, after electronically resetting the selected pixel and prior to reading the selected pixel's output.

23. An imager comprising:

(a) one or more pixels capable of providing outputs indicative of a quantity or a type or both the quantity and type of radiation to which each of the one or more pixels has been exposed;

(b) one or more circuit elements electrically coupled to the one or more pixels and configured to mask or correct faulty pixels in the imager; and

(c) a memory configured to store the locations of the faulty pixels.

24. The imager of claim 23, wherein the one or more pixels, the one or more circuit elements, and the memory are provided on a single integrated circuit chip.

25. The imager of claim 23, wherein the imager is a CMOS imager and the one more pixels each comprise a photodiode diffusion formed in a well and a tap to power or ground also formed in the well.

26. The imager of claim 25, further comprising one or more voltage sources capable of delivering a voltage to the photodiode diffusions of the one or more pixels, which voltage corresponds to a reset state of the pixels.

27. The imager of claim 26, further comprising one or more charge integrators capable of measuring the pixel outputs.

28. The imager of claim 23, further comprising an analog-to-digital converter capable of receiving analog outputs from said one or more pixels, converting the analog outputs to digital signals, and providing the digital signals to said one or more circuit elements such that the one or more circuit elements can identify faulty pixels.

29. The imager of claim 23, wherein a plurality of the one or more pixels is arranged in an array such that each of the pixels in said plurality of pixels is separately addressable.

30. The imager of claim 23, wherein the one or more pixels are selected from the group consisting of active pixels and passive pixels.

31. A system for producing an image of an object, the system comprising:  
    (a) an imager comprising,  
        (i) one or more pixels capable of providing outputs indicative of a quantity or a type or both the quantity and type of radiation to which each of the one or more pixels has been exposed;  
        (ii) one or more circuit elements electrically coupled to the one or more pixels and configured to mask or correct faulty pixels in the imager; and  
        (iii) a memory configured to store the locations of the faulty pixels, wherein the one or more pixels, the one or more circuit elements, and the memory are provided on a single integrated circuit chip; and  
    (b) means for outputting an image resulting from the outputs of the one or more pixels.

32. The system of claim 31, wherein the image output by the means for outputting is a photograph.

33. The system of claim 31, wherein the means for outputting is a display.

34. The system of claim 31, wherein the imager is a CMOS imager and the one more pixels each comprise a photodiode diffusion formed in a well and a tap to power or ground also formed in the well.

35. The system of claim 31, wherein the imager further comprises an analog-to-digital converter capable of receiving analog outputs from said one or more pixels, converting the analog outputs to digital signals, and providing the digital signals to said one or more circuit elements such that the one or more circuit elements can identify faulty pixels.

36. The system of claim 31, wherein a plurality of the one or more pixels is arranged in an array such that each of the pixels in said plurality of pixels is separately addressable.

37. The system of claim 31, wherein the one or more pixels are selected from the group consisting of active pixels and passive pixels.